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ABSTRACT

This booklet, intended primarily for the trainers of middle-level community health workers in underdeveloped countries, is designed to help such workers present the topic of diarrhea treatment and prevention in training courses. Divided into five sections, the booklet gives guidelines on treatment and prevention, with particular emphasis on the use of oral rehydration in children. It describes, in simple terms, the importance of preventing dehydration in a child with diarrhea, and gives instructions for making rehydration solution, using either packets of oral rehydration salts or locally available materials. Easy-to-follow charts summarize the management of diarrhea and indicate the signs and symptoms that the health worker should look for in assessing the patient and determining treatment. The importance of good domestic hygiene and appropriate child-care practices in preventing diarrhea is stressed, and the role of the health worker in educating the community is given particular attention. (KC)

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TREATMENT AND PREVENTION OF ACUTE DIARRHOEA

Guidelines for the trainers of health workers

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GENEVA
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WHO welcomes comments on this guide and information on experience in its use; these should be addressed to:

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FOREWORD

These guidelines are a modification of an earlier unpublished WHO document, WHO/CDD/SER/80.1. The text herein forms the technical basis of the module entitled *Treatment of diarrhoea* in the Supervisory Skills Training Course of the WHO Diarrhoeal Diseases Control Programme.

The guidelines are divided into five sections; each section is followed by a list of points of essential knowledge required by a health worker for the prevention and treatment of diarrhoea. The 14 points of essential knowledge covered are summarized in Annex 5. Annex 7 presents the Diarrhoea Treatment Chart, which summarizes the approach to management of diarrhoea. This chart may be adapted to local conditions and should be available to the health worker for reference at all times.

1. UNDERSTANDING THE PROBLEM

What is diarrhoea?

The number of stools normally passed in a day varies with the diet and the person. The stools of a person with diarrhoea contain more water than normal—they are often called *loose* or *watery* stools.

Mothers usually know when their children have diarrhoea. When diarrhoea occurs, a mother may say that the stools smell strongly or pass noisily, as well as being loose or watery. By talking to mothers, you can often find a useful local definition of diarrhoea. In many societies, diarrhoea is defined as 3 or more loose or watery stools in a day.

Diarrhoea is most common in children, especially those between 6 months and 2 years of age. It is also common in babies under 6 months of age who are drinking cow's milk or infant feeding formulas.

Frequent passing of normal stools is *not* diarrhoea.

Breast-fed babies often have stools that are softer than normal; this is *not* diarrhoea.

Acute and chronic diarrhoea

Acute diarrhoea starts suddenly and may continue for several days. It is caused by infection of the bowel.

Chronic diarrhoea lasts for more than 3 weeks and may vary from day to day. It can be caused by things such as infection or complications resulting from infection (for example, malabsorption).

Why is diarrhoea dangerous?

The two main dangers of diarrhoea are *death* and *undernutrition*.

Death from acute diarrhoea most often results from loss of a large amount of water and salt from the body. This loss is called *dehydration*.

Diarrhoea is worse and often more common in persons with undernutrition. Diarrhoea can cause undernutrition and can make existing undernutrition worse, because:

- nutrients are lost from the body in diarrhoea;
- a person with diarrhoea may not be hungry; and
- mothers often make the mistake of not feeding a child while he or she has diarrhoea, or even for some days after the child is better. Food *should* be given to children with diarrhoea as soon as they want to eat.

How does diarrhoea cause dehydration?

The body normally takes in the water and salts it needs (*input*) from drinks and food. The body normally loses water and salts (*output*) through stools, urine, and sweat.

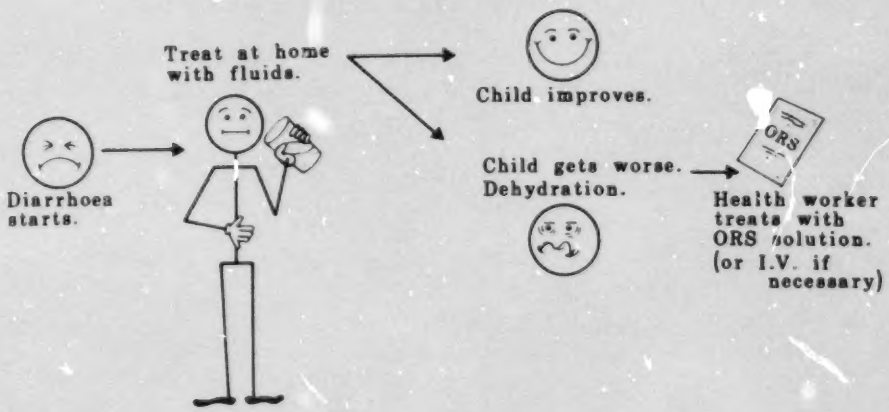
When the bowel is healthy, water and salts pass from the bowel into the blood. When a person has diarrhoea, the bowel is not working normally, and more than the normal amount of water and salts is passed in the stool and less than the normal amount passes into the blood.

This larger-than-normal loss of water and salts from the body results in dehydration. Dehydration occurs when the output of water and salts is greater than the input. The more diarrhoea stools a patient passes, the more water and salts he loses. Dehydration can also be caused by vomiting, which often accompanies diarrhoea.

Dehydration occurs faster in infants and young children, in hot climates, and when the person has a fever.

Treating diarrhoea

The most important aims of the treatment of diarrhoea are: (i) if possible, to *prevent* dehydration from occurring: and (ii) if dehydration does occur, to treat it quickly and effectively.


Treat at home with fluids.
Child improves.
Diarrhoea starts.
Child gets worse. Dehydration.
ORS
Health worker treats with ORS solution. (or I.V. if necessary)

Prevention of dehydration

Dehydration can usually be prevented in the home if the infected person drinks more fluids as soon as the diarrhoea starts. He or she should be given locally available fluids, such as rice water, fruit juice, weak tea, or special home-made sugar and salt solutions, and/or breast-feeding should be increased. The types of fluid or solutions that can be used in your area for preventing dehydration in the home will depend on:

- local traditions,
- availability of salt and sugar,
- access of people to health services,
- availability of oral rehydration salts (ORS), and
- national policy.

Treatment of dehydration

If dehydration occurs, the child should be brought to a community health worker (CHW) or health centre for treatment. The best treatment for dehydration, once it has occurred, is oral rehydration therapy using a solution made with oral rehydration salts (ORS). Although this manual mostly describes the treatment of children with diarrhoea, the same treatment is applicable to adults with diarrhoea. If possible, oral rehydration salts should *always* be used for the treatment of dehydration.

Essential knowledge: Section 1

The health worker should be able to:

— define diarrhoea in a way that is appropriate to the setting in which he/she works
— distinguish between acute and chronic diarrhoea
— explain why diarrhoea is dangerous
— explain how diarrhoea causes dehydration
— describe the basic principles of the treatment of diarrhoea.

2. PREVENTING DEHYDRATION

Educating family members about home treatment of diarrhoea

When a child gets diarrhoea, dehydration can often be prevented if certain procedures are followed *in the home*. Teaching family members that diarrhoea *can* and *should* be treated at home is very important. Family members also need to learn *how* to give treatment.

Family members may learn from many sources, such as radio broadcasts, schools, posters, community meetings, the community health worker, or staff at the local health centre. CHWs should meet with community leaders and community members in order to identify several sources that together will reach all the families in the area. With help and cooperation from community members, each family can learn about treatment of diarrhoea in the home.

There are three rules for treating diarrhoea in the home; these are discussed in the following paragraphs. They are also summarized on a small card called *How to treat diarrhoea at home*, which mothers should take home (Annex 6), and in treatment plan A on the Diarrhoea Treatment Chart (Annex 7), which health workers should keep for reference. Whenever a child gets diarrhoea, the mother (or any other family members who care for the child) should follow these rules.

Three rules for home treatment of diarrhoea

Rule 1: Give the child more fluids than usual

- If the child is breast-fed, try to give breast milk more often. If the child is not breast-fed, increase the amount of normal milk feed and dilute the feed with an equal volume of water.
- Give the child locally available drinks or liquids, such as rice water, soups, weak tea, or fruit juices, and/or carefully prepared sugar and salt solutions. These solutions can be made in several ways (see Annex 1).

● Children under 2 years old should receive approximately 50–100 ml (¼–½ cup) of fluid after each loose stool, and older children should receive twice this amount. Adults should take as much as they want to drink.

Rule 2: Continue feeding the child

● Starving a child who has diarrhoea can cause undernutrition or make any existing undernutrition worse.

● All children of 4 months or older, who have been weaned, should be offered solid food during diarrhoea. The best foods to give are those that are ***easily digested*** (such as boiled rice, porridge, soups, milk products, eggs, fish, and well-cooked meat) and those ***containing potassium*** (such as pineapple, bananas, and coconut water). Some fat or oil may also be given. Even though the absorption of nutrients from food is lessened during diarrhoea, most of the nutrients will be absorbed from these foods.

● The child should be allowed to eat as much as he wants. Food should be offered often (5–7 times a day) during diarrhoea, because the child is not likely to eat much at each time. The child should have at least one extra feed a day for a week after the diarrhoea has stopped.

Rule 3: Watch for signs of dehydration

● The signs of dehydration are described in Section 3 (p. 7).

● If a child develops any sign of dehydration, or if his diarrhoea lasts another 2 days, the mother should take the child to the community health worker or health centre.

CHWs and workers at health facilities should explain the three rules of home treatment to mothers and other family members whenever they have the opportunity (for example, when a mother comes for prenatal visits or brings her child for immunizations).

When explaining how to treat diarrhoea at home, a health worker should actually *show* the mother what to do, so that she will understand and remember the procedure. For example, the health worker should show how much fluid the child should be given, and how to make sugar and salt solution. The examples are better shown than explained.

A mother should also be allowed to practise what she learns (for example, mixing the solution) to make sure she can do it.

For those things that can only be explained (for example, actually feeding the child), the health worker should ask the mother to tell in her own words what she has learned to be sure that she remembers.

Essential knowledge: Section 2

The health worker should be able to:

— explain and demonstrate to family members how to treat diarrhoea in the home to prevent dehydration

— explain the three rules for home treatment:

- increase fluids,
- continue food, and
- watch for signs of dehydration.

3. ASSESSING A CHILD WITH DIARRHOEA

Since the most dangerous effect of diarrhoea is dehydration, the first step on seeing a child with diarrhoea should be to assess the child for signs of dehydration. The procedure outlined here for evaluation of dehydration should be followed when a health worker sees a child whose mother has stated that diarrhoea is *the* reason, or *one* of the reasons, for the child's visit. (Health workers should be familiar with all locally used words for diarrhoea or for the various signs of diarrhoea.) These same procedures should be followed again when the health worker reassesses the patient after giving some treatment.

Note: Mothers will probably expect the health worker to give a treatment that will *stop* the child's diarrhoea. It may be necessary to explain that oral rehydration treatment is meant to stop or prevent dehydration, and explain why this is more important than immediately stopping the diarrhoea.

Examining the child

The signs a health worker should *ask*, *look*, and *feel* for are listed in this section and in the chart shown on page 11 and in Annex 7. A list of the questions that the health worker should ask, the conditions he should feel for, and the things he should look for are presented here. As he is reading this material, he should refer to the chart in order to see how to interpret each sign.

The health worker should:

1. ASK the following questions.

- How many liquid stools per day is the child passing? For how long has the child had diarrhoea? Is there blood (more than 1 or 2 streaks) and mucus in the stool?
- Has there been any vomiting?
  If so:
  —Has there been more than a small amount?
  —How frequently has the child vomited?

- Is the child able to drink? If so, is he thirstier than normal?
- Has the child passed urine in the last 6 hours?
  If so:
  —Was it a normal amount or a small amount?
  —Was it darker than normal?

2. LOOK for the following conditions.

- What is the child's general condition?
  —Is he well and alert?
  —Is he unwell, sleepy, or irritable?
  —Is he very sleepy, floppy, or unconscious?
  —Is he having fits?
  —Is he severely undernourished?

Note: A health worker may be able to tell simply by observation whether a child has severe undernutrition. If he cannot tell by observation, he can determine whether a child between 1 and 5 years old is undernourished by measuring the upper arm. If the distance around the arm is less than 12.5 cm, the child is severely undernourished. One way to measure the arm is with a tricoloured arm-strip (the method is explained fully in Annex 4). If the 0 (zero) cm mark touches the red part of the strip when it is placed around the child's arm, the child is severely undernourished.

- Does the child have tears when he cries?
- Are his eyes normal, sunken, or very dry and sunken?
- Is his mouth wet, dry, or very dry?
- Is his breathing normal, faster than normal, or very fast and deep?

3. FEEL for the following.

- When the skin is pinched, does it go back quickly, slowly, or very slowly (taking longer than 2 seconds)? In a baby, the health worker should pinch the belly; he may also pinch the back of the neck, or back of the hand.

Note: Pinching the skin may give misleading information in severely undernourished or obese patients. In the severely undernourished patient, the skin may go back slowly even if the patient is not dehydrated. In the obese patient, the skin may go back quickly even if the patient is dehydrated.

- Can the pulse be felt? If so, is it normal, faster than normal, very fast, or weak?

● Is the fontanelle (the soft spot on top of the head) normal, sunken, or very sunken?

Note: This sign is only helpful in children whose fontanelle is not yet closed (usually children under 12 months old).

4. WEIGH the child if possible.

● If the child has been weighed routinely, one can notice sudden weight losses during a diarrhoeal illness which can indicate the presence and extent of dehydration. Weighing the child at intervals during therapy is also helpful in assessing the progress of rehydration.

● If a weighing machine is available, carefully weigh the child unclothed or lightly clothed. If the child has been routinely weighed and his weight recorded, compare the child's present weight with his last recorded weight.

—Has there been any weight loss during the diarrhoea? If so, has there been a weight loss of 25–100 grams for each kilogram of the child's weight or has the weight loss been more than 100 grams for each kilogram of body weight?

Note: This may be difficult to determine without a very accurate weighing machine. For this reason, it is best to rely on assessment of other signs in making a judgement about dehydration.

● If a weighing machine is not available, *do not* delay treatment.

5. TAKE the child's temperature.

● Does the child have a high fever (more than 38.5 °C or 101 °F)?

Note: Take the child's temperature either in the rectum or the armpit. Rectal temperature should only be taken if the health worker is used to that procedure and has several rectal thermometers, or is able to disinfect the thermometer after each use. Otherwise, the axillary (armpit) temperature should be taken.

Determining appropriate treatment

● Look on the chart entitled "How to assess your patient" (page 11) for the signs that describe the child's condition.

● Determine if any of the signs in column D are present. If so, there are serious problems which require treatment *in addition to* any treatment that may be needed for dehydration. Treat these problems according to customary practice or refer for

treatment. If there is a lot of blood or mucus in the stools *and* high fever, suspect dysentery. Treat this problem with antimicrobial drugs.

- Determine the degree of dehydration:
  - —Look at column C. If two or more of the signs listed in column C are present, conclude that the patient has *severe dehydration*.
  - —If fewer than two signs from column C are present, look at column B. If two or more of the signs listed in column B are present, conclude that the patient has *some dehydration*.
  - —If fewer than two signs from column B are present, conclude that the patient has *no signs of dehydration*.

- Select the appropriate treatment plan according to the degree of dehydration. (These treatment plans are described on pages 15–17 and also form part of the Diarrhoea Treatment Chart (Annex 7).)
  - —If there are no signs of dehydration, select treatment plan A—to prevent dehydration.
  - —If there is some dehydration, select treatment plan B—to treat dehydration with ORS solution.
  - —If there is severe dehydration, select treatment plan C—to treat severe dehydration quickly.

Essential knowledge: Section 3

The health worker should be able to:
- ask, look, and feel for signs of dehydration and other serious problems
- determine the appropriate treatment plan using the assessment chart given on page 11.

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How to assess your patient

		A	B	C	D
1 ASK ABOUT	DIARRHOEA	Less than 4 liquid stools per day	4 to 10 liquid stools per day	More than 10 liquid stools per day	Longer than 3 weeks duration (chronic diarrhoea)
	VOMITING	None or a small amount	Some	Very frequent	Blood or mucus in the stool
	THIRST	Normal	Greater than normal	Unable to drink	
	URINE	Normal	A small amount, dark	No urine for 6 hours	
2 LOOK AT	CONDITION	Well, alert	Unwell, sleepy or irritable	Very sleepy, unconscious, floppy or having fits	Severe undernutrition
	TEARS	Present	Absent	Absent	
	EYES	Normal	Sunken	Very dry and sunken	
	MOUTH and TONGUE	Wet	Dry	Very dry	
	BREATHING	Normal	Faster than normal	Very fast and deep	
3 FEEL	SKIN	A pinch goes back quickly	A pinch goes back slowly	A pinch goes back very slowly	
	PULSE	Normal	Faster than normal	Very fast, weak, or you cannot feel it	
	FONTANELLE (in infants)	Normal	Sunken	Very sunken	
4 TAKE TEMPERATURE					High fever - 38.5°C (or 101°F) or greater
5 WEIGH IF POSSIBLE		No weight loss during diarrhoea	Loss of 25-100 grams for each kilogram of weight	Loss of more than 100 grams for each kilogram of weight	
6 DECIDE		The patient has no signs of **dehydration** Use Plan A	If the patient has 2 or more of these signs, he has **some dehydration** Use Plan B	If the patient has 2 or more of these danger signs, he has **severe dehydration** Use Plan C	If the patient has chronic diarrhoea, severe undernutrition, or high fever, treat or refer to _____ for treatment If there is blood or mucus in the stool and high fever, suspect dysentery and treat with antimicrobials

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Example of assessment of a child with diarrhoea

A mother brought her 3-year-old daughter, Rania, into a clinic because she had diarrhoea. The health worker asked, looked, and felt for signs of dehydration. When he had completed the assessment, the chart looked like this:

		A	B	C	D
1 ASK ABOUT	DIARRHOEA	Less than 4 liquid stools per day	4 to 10 liquid stools per day	More than 10 liquid stools per day	Longer than 3 weeks duration (chronic diarrhoea)
	VOMITING	None or a small amount	Some	Very frequent	Blood or mucus in the stool
	THIRST	Normal	Greater than normal	Unable to drink	
	URINE	Normal	A small amount, dark	No urine for 6 hours	
2 LOOK AT	CONDITION	Well, alert	Unwell, sleepy or irritable	Very sleepy, unconscious, floppy or having fits	Severe undernutrition
	TEARS	Present	Absent	Absent	
	EYES	Normal	Sunken	Very dry and sunken	
	MOUTH and TONGUE	Wet	Dry	Very dry	
	BREATHING	Normal	Faster than normal	Very fast and deep	
3 FEEL	SKIN	A pinch goes back quickly	A pinch goes back slowly	A pinch goes back very slowly	
	PULSE	Normal	Faster than normal	Very fast, weak, or you cannot feel it	
	FONTANELLE (in infants)	Normal	Sunken	Very sunken	
4 TAKE TEMPERATURE					High fever - 38.5°C (or 101°F) or greater
5 WEIGH IF POSSIBLE		No weight loss during diarrhoea	Loss of 50-100 grams for each kilogram of weight	Loss of more than 100 grams for each kilogram of weight	
6 DECIDE		The patient has no signs of **dehydration** Use Plan A	If the patient has 2 or more of these signs, he has **some dehydration** Use Plan B	If the patient has 2 or more of these danger signs, he has **severe dehydration** Use Plan C	If the patient has chronic diarrhoea, severe undernutrition, or high fever, treat or refer to _____ treatment If there is blood or mucus in the stool and high fever, suspect dysentery and treat with antimicrobials

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Because Rania had blood and mucus in her stool and a high fever (column D), the health worker suspected dysentery and prescribed ampicillin. Since Rania had no signs from column C and only 1 sign from column B, the health worker determined that she had no signs of dehydration. Therefore treatment plan A was used to prevent Rania from becoming dehydrated.

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4. TREATMENT OF DIARRHOEA

Treatment of children with signs of dehydration (especially treatment plan B) involves using a solution made with oral rehydration salts (ORS). Preparation of ORS solution is a skill that all health workers should be taught by being shown and being allowed to practise.

Ingredients of ORS solution

ORS often come in packets. These packets should contain the ingredients shown in Table 1.

Table 1. The ingredients of ORS

	Ingredient	Other common name(s)	Chemical formula	Amount
1.	Sodium chloride	Common salt Table salt	NaCl	3.5 grams
2.	Glucose, anhydrous[a] *or* Glucose, monohydrate *or* Sucrose	Dextrose, anhydrous Dextrose, monohydrate Saccharose Common sugar	$C_6H_{12}O_6$ $C_6H_{12}O_6 . H_2O$ $C_{12}H_{22}O_{11}$	20.0 grams 22.0 grams 40.0 grams
3.	Trisodium citrate, dihydrate[a] *or* Sodium hydrogen carbonate	Sodium citrate Sodium bicarbonate Bicarbonate of soda Baking soda	$C_6H_5Na_3O_7 . 2H_2O$ $NaHCO_3$	2.9 grams 2.5 grams
4.	Potassium chloride		KCl	1.5 grams

[a] Preferred ingredient.

Packets that contain the ingredients in these amounts are made for mixing in *one litre* of drinking-water. This mixture is called ORS solution.

Note: Some packets of ORS are made for smaller volumes of water; they have smaller amounts of the same ingredients. When ORS packets are not available, oral rehydration solution can be made by following the instructions in Annex 2.

How to prepare ORS solution

- Wash your hands.
- Measure one litre (or volume of water indicated on packet used) of clean drinking-water into a clean container. It is best to boil and cool the water, but if this is not possible, use the cleanest water available. Use whatever clean container is available such as a jar, pot, or bottle.

- Pour all the powder from one packet into the water and mix well until the powder is completely dissolved.
- Taste the solution so that you know what it tastes like.

Fresh ORS solution should be mixed *each day* in a clean container. The container should be kept covered. Any solution remaining from the day before should be thrown away.

How to treat a child with diarrhoea

On the basis of the assessment of the degree of dehydration of the child, the health worker should select one of the following treatment plans:

- Treatment plan A—to prevent dehydration;
- Treatment plan B—to treat dehydration with ORS solution;
- Treatment plan C—to treat severe dehydration quickly.

Initially, the health worker follows one of these treatment plans; he may also need to treat other serious problems that have been identified.

In all cases, the mother should first be complimented on bringing the child to be cared for.

TREATMENT PLAN A
TO PREVENT DEHYDRATION

Explain to the mother how to treat diarrhoea at home following three rules:

1. GIVE YOUR CHILD MORE FLUIDS THAN USUAL, such as:
   - rice water, fruit juice, weak tea, soup, or salt and sugar solution; and
   - breast milk, or milk feeds mixed with equal amounts of water.

2. GIVE YOUR CHILD FOOD:
   - as much as he wants;
   - 5 to 7 times a day;
   - which is easy to digest;
   - which contains potassium.

3. WATCH FOR SIGNS OF DEHYDRATION. (You must show the mother how to ASK, LOOK, and FEEL for the signs. Then ask her to show you what she has learned.)

   BRING YOUR CHILD BACK, IF:
   - you see any signs;
   - your child has diarrhoea for another two days.

Tell the mother these rules are important.
Explain that she can prevent diarrhoea, if:

- she gives her child fresh, clean and well-cooked food and clean drinking-water;
- she practises good hygiene.

Show the mother how to prepare and give ORS solution at home, if:

- her child has been on plan B;
- it is national policy to give ORS solution to all children who visit a health centre for diarrhoea treatment;
- the mother cannot come back if the diarrhoea gets worse.

GIVE THE MOTHER ENOUGH ORS PACKETS FOR 2 DAYS.

TELL HER THAT, AFTER EACH LOOSE STOOL, SHE SHOULD GIVE:

- 50–100 ml (¼–½ cup) of ORS solution for a child less than 2 years old;
- 100–200 ml for older children.

Adults can take as much as they want.

If the child vomits, she should wait 10 minutes and then continue slowly giving small amounts.

NOTE: Children being given ORS solution should **not** also receive salt and sugar solution.

TREATMENT PLAN B
TO TREAT DEHYDRATION WITH ORS SOLUTION

1. USE THIS TABLE TO SEE HOW MUCH ORS SOLUTION IS SUITABLE FOR 4–6 HOURS' TREATMENT:

Patient's weight in kilograms		3 5 7 9 11 13 15 20 30 40 50					
Patient's age *		2 4 6 8 10 12 18 2 3 4 6 8 15 adult ← months → ← years →					
Give this much solution for 4-6 hours	in ml:	200-400	400-600	600-800	800-1000	1000-2000	2000-4000
	in local unit of measure:						

* Use the patient's age only when you do not know the weight.

If the patient wants more ORS solution, give more. If the eyelids become puffy, stop and give other fluids. If diarrhoea continues, use ORS solution again when the puffiness has gone.

If the child vomits, wait 10 minutes and then continue slowly giving small amounts of ORS solution.

2. If the mother can remain at the health centre:
- tell her how much ORS solution to give her child;
- show her how to give it;
- watch her give it.

3. After 4–6 hours reassess the child.
Then choose the suitable treatment plan.

NOTE: FOR CHILDREN UNDER 12 MONTHS CONTINUING TREATMENT PLAN B AFTER 4–6 HOURS, TELL THE MOTHER TO GIVE:
- breast-milk feeds between drinks of the ORS solution, or
- 100–200 ml of clean water before continuing ORS, if she does not breast-feed her child.

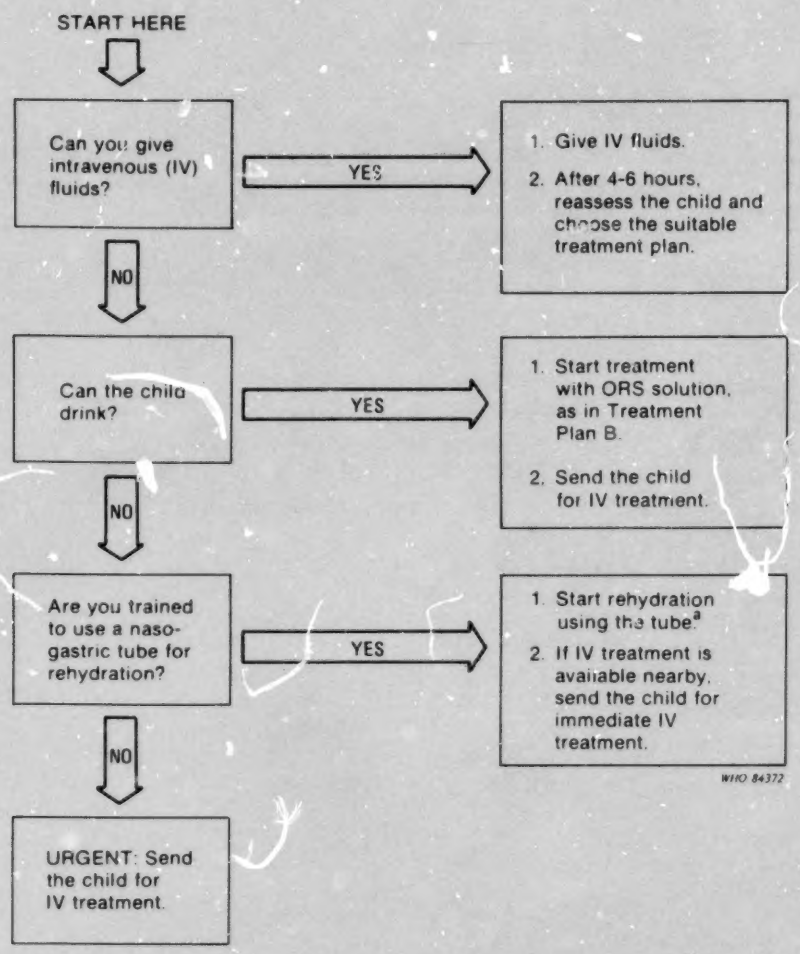
4. If the mother must leave before completing treatment plan B, tell her:
- to finish the 4–6 hour treatment as in 1 above;
- to give the child as much ORS solution as he wants after the treatment;
- to look for signs of dehydration and, if the child has any, to return the next morning.

Give her enough ORS packets for 2 days and show her how to prepare ORS solution.

Explain briefly how to prevent diarrhoea.

TREATMENT PLAN C
TO TREAT SEVERE DEHYDRATION QUICKLY

Follow the arrows. If the answer to the questions is 'yes', go across. If it is 'no', go down.


START HERE
Can you give intravenous (IV) fluids?
YES
1. Give IV fluids.
2. After 4-6 hours, reassess the child and choose the suitable treatment plan.
NO
Can the child drink?
YES
1. Start treatment with ORS solution, as in Treatment Plan B.
2. Send the child for IV treatment.
NO
Are you trained to use a naso-gastric tube for rehydration?
YES
1. Start rehydration using the tube[a]
2. If IV treatment is available nearby, send the child for immediate IV treatment.
NO
URGENT: Send the child for IV treatment.
WHO 84372

NOTE: If the child has a high fever, show the mother how to cool the child with a wet cloth and fanning.

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[a]See Annex 3.

If a child vomits while being given ORS solution, wait 10 minutes then continue to give ORS solution slowly and in small amounts.

Some health workers may not have the skills or knowledge or the supplies needed to perform all the steps listed in each treatment plan. *The trainer must determine which procedures can be performed by a health worker in a community setting and which procedures can be performed only by a health worker in a facility.*

Recording data on the child

Health workers in the community and in the health facility should keep a record on each patient who comes for treatment or for one of the regular services.

At a *minimum*, each child must be identified in the records by:

- name
- age (or date of birth)
- date of visit
- reason for visit
- diagnosis
- type of treatment or service provided.

This information is needed because a health worker should be able to determine, each month, the total number of episodes of diarrhoea treated in children less than 5 years old and the number of children receiving other services.

Additional data that may be recorded include sex, address (the health worker may also ask what distance the patient has travelled to receive treatment), and information obtained in the physical examination.

These records should be kept for periodical review by the supervisor in order to monitor the use of various services and to help plan future services.

The forms used for patient records may be different in different facilities or areas. It is important that the form contains at least the minimum data described above, and that the form is easy to understand and easy to fill in. If existing record-keeping systems in your health area do not include this minimum information, you might want either to modify them to include that information or to create new forms. If the same form is used by all the health workers in your area, it will be easier to collect data when monitoring the use of services.

Essential knowledge: Section 4

The health worker should be able to:

— demonstrate how to prepare ORS solution correctly
— demonstrate how to prepare alternative solutions and explain when this is appropriate
— utilize treatment plans A, B, and C correctly
— keep appropriate records of treatment given.

Remember this about treatment of diarrhoea

- The most important problem that must be treated in a patient with diarrhoea is dehydration.
- Family members should be educated about treating diarrhoea properly in the home. This can often prevent dehydration from occurring.
- When a child comes to a health worker with diarrhoea, the health worker should:
  —ask, look, and feel for signs of dehydration;
  —select a treatment plan based on the degree of dehydration;
  —give oral rehydration therapy to dehydrated children;
  —check for serious problems other than diarrhoea, and give appropriate treatment for any serious problems found.
- Use the Diarrhoea Treatment Chart when assessing and treating children with diarrhoea.

5. PREVENTING DIARRHOEA

An important job of the health worker is to help prevent diarrhoea by teaching people some simple facts about food and feeding children, water, and hygiene.

Food and how best to feed children

Table 2 summarizes all of the following points:

- Breast-feeding, whenever the baby wants to be fed, is very important in the first 4–6 months of life. Breast milk is the *best* food for babies of this age and helps to prevent and stop infections, including diarrhoea. Breast-feeding should continue for at least 2 years.
- When breast-feeding is not possible, milk formulas must be given. It is better to give milk formulas with a cup and spoon than a bottle. Feeding babies milk from bottles is not good because it is difficult to keep the bottles clean.
- It is important that mothers know that they should eat *more* food than normal during pregnancy and when they are breast-feeding.

- At 4–6 months *all* babies should start to have other foods as well as milk or milk formula. Soft mashed foods are best.
- All food should be fresh and prepared in a clean place using clean pots and utensils.
- Cooked food should be eaten while still hot, or well heated again before eating.
- Uncooked food should be washed in clean water before eating.

Table 2. Feeding children[a]

Child's age	Breast-feeding	Other foods
Birth	Start at birth. Feed whenever the baby wants	None, unless not enough breast milk
4 months	Continue	Add at least two other soft, mashed foods[b] twice a day
6 months	Continue	Add other foods[b] four times a day
One year or older	Continue up to at least 2 years of age	All foods 4–6 times a day

[a] Adapted from *Guidelines for training community health workers in nutrition*. Geneva, World Health Organization, 1981 (Offset Publication, No. 53).

[b] These foods should be "energy-rich". Most staple foods (such as cereals, roots, tubers, and stems) do not contain enough energy per unit weight for infants and young children. Where possible, some oils, fats, or sugars should be added. The diet should be varied with the addition of legumes, meats, fish, fresh fruits, and leafy green vegetables.

Water

- Drinking-water should be taken from the cleanest possible source. Unless you are sure that the water is safe, it should be boiled before drinking. This water should be kept in a clean, covered container and used *only* for drinking.
- Washing the body, clothes, or pots and utensils should not be done at the source of the drinking-water.
- Stools and urine should not be passed in or near the source of drinking-water.

Hygiene

Hygiene concerns activities to stop germs from infecting the body. These activities involve the village, the household, and each person at home. The health worker should discuss the points listed below with *all* members of the village. He should learn from them the local beliefs about diarrhoea, encourage the beliefs that are helpful, and explain why some local practices are harmful.

- The messages in the previous sections about food preparation and water are also about *hygiene*.
- Dirt, rubbish, stools, and urine contain germs that cause infections sometimes resulting in diarrhoea.
- Stools and urine should be passed in a latrine, which should be kept clean. If there is no latrine, stools and urine should be passed in one place away from the village and away from the source of drinking-water. Stools passed by children near the house should be taken away or buried.
- Hands should always be washed after passing stools and before preparing food, eating, or feeding children. Children's hands should be washed too.

- Rubbish should be burned, buried, or taken to a place far away from the village and away from the source of drinking-water.
- Flies carry germs from dirt, rubbish, and stools into the house and on to food. Flies should be kept away from stools (by burying stools), from latrines (by keeping them clean), from rubbish (by burning or burying), and from food (by keeping it covered).

Essential knowledge: Section 5

The health worker should be able to:

— explain to family members the principles of preventing diarrhoea, with reference to:
- food and feeding children,
- water, and
- hygiene.

ANNEX 1. HOW TO MAKE SALT AND SUGAR SOLUTION AT HOME

A special drink (salt, sugar, and water) can be made at home to treat diarrhoea and prevent dehydration. There are many methods that can be used for measuring the correct amounts of sugar and salt. The following are two examples.

Example 1

This example shows a method for mixing *one litre* of special drink.

What you need

- A spoon. This should be a small spoon (a teaspoon) that holds 4–5 ml of fluid.
- A clean container that will hold 1 litre or a little more.
- Salt, as used on food or for cooking.
- Sugar of any sort—unrefined lump sugar or purified sugar.
- Drinking-water (clean or boiled water).

What to do

- Measure one litre of drinking-water into the container; this can be done, for example, by measuring out 5 cupfuls of about 200 ml each.
- Take salt in a teaspoon, level it with a knife or a flat object (see Fig. A1). Add one level spoonful of salt to the water and mix.
- Taste the salt and water. It should *not* be very salty. If it tastes more salty than tears, pour away this mixture and make it again with less salt.
- Take 8 level teaspoonfuls of sugar. Put these in the water and mix.

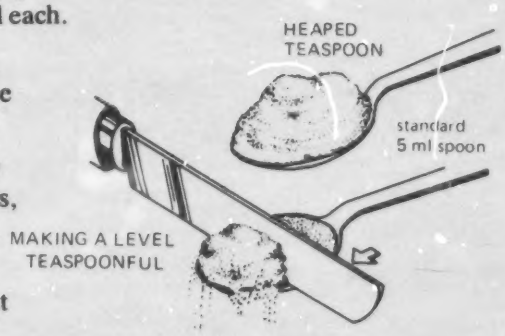


Fig. A1. When measuring salt and sugar, do *not* use a heaped teaspoon. Make a level teaspoonful by using a knife or other flat object. (Fig. A1–A4 are reproduced from KING, M. ET AL. *Primary child care. A manual for health workers*. Oxford, Oxford University Press, 1978.)

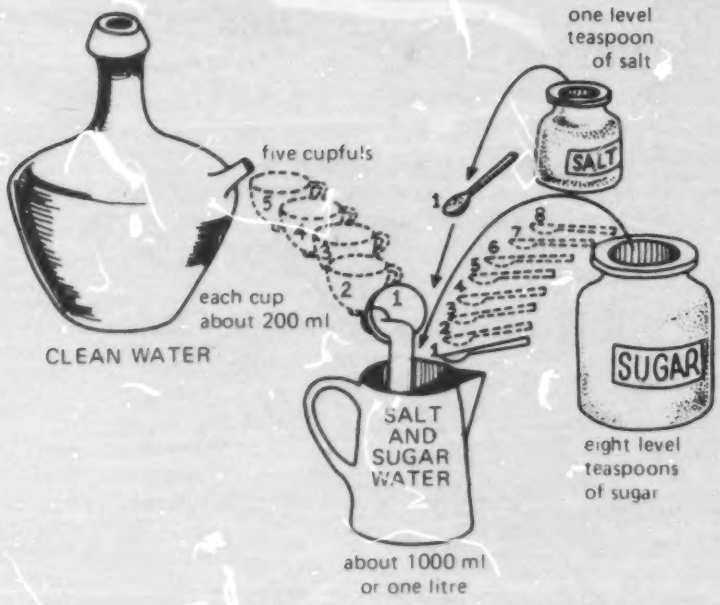


Fig. A2. How to make salt and sugar water.

Example 2

This example shows a method for mixing *one glass* (about $\frac{1}{3}$ litre) of special drink.

What you need

- A clean, medium-sized glass or other medium-sized container (such as a juice can or beer can).
- Salt, as used on food or for cooking.
- Sugar of any sort—unrefined lump sugar or purified sugar.
- Drinking-water (clean or boiled water).

What to do

- Fig. A3 shows you what to do.

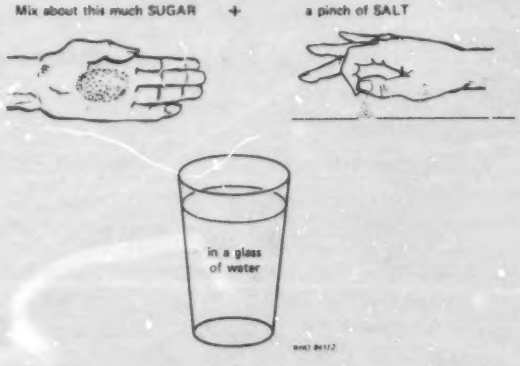


Fig. A3. How to make one glass of salt and sugar solution.

ANNEX 2. WHAT TO DO WHEN ORS PACKETS ARE NEEDED BUT NOT AVAILABLE

The health worker must be instructed on what to do when his supply of packets of ORS is finished. He should understand the routine procedure for ordering more, and know how to obtain emergency supplies quickly.

If packets of ORS are not available, oral rehydration solution can be made with the salts and sugars shown in Table 3.

Table 3. Salts and sugars required to make ORS solution

	Salts and sugars	Amount required for one litre of solution[a]	Note
1.	Sodium chloride (common salt)	3.5 grams	You cannot make rehydration solution without sodium chloride
2.	Glucose, anhydrous *or* glucose, monohydrate *or* sucrose (common sugar)	20 grams 22 grams 40 grams	You cannot make rehydration solution without either glucose or sucrose
3.	Trisodium citrate, dihydrate *or* sodium bicarbonate (baking soda)	2.9 grams 2.5 grams	You can make rehydration solution without either of these salts, but it is much better if you have one of them.
4.	Potassium chloride	1.5 grams	You can make rehydration solution without potassium but it is much better if you have it.

[a] The sugar and salts (in the amounts shown) should be completely dissolved in one litre of clean drinking-water (water that has been boiled and allowed to cool before use is best).

The salts and sugars can be measured by any of the following methods:

1. Scales may be available, for example, in a local pharmacy.
2. Small volume measures, such as 5- or 10-ml syringes (see Fig. A4), can be used to give approximate weights as follows:

3 ml ≙ 3.5 g of sodium chloride
3 ml ≙ 2.9 g of trisodium citrate dihydrate
3 ml ≙ 2.5 g of sodium bicarbonate
1.5 ml ≙ 1.5 g of potassium chloride
30 ml ≙ 20.0 g of glucose anhydrous
50 ml ≙ 40.0 g of sucrose

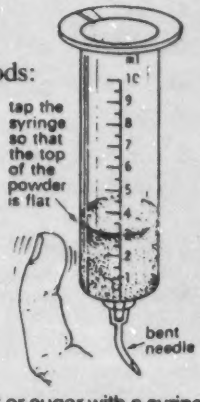
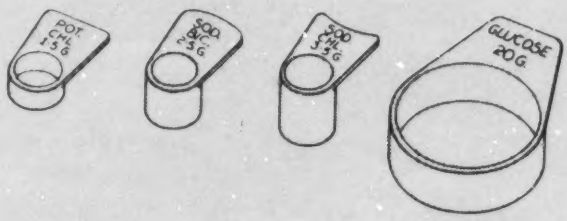


Fig. A4. Measuring salt or sugar with a syringe.

3. Measuring spoons can be used. The measuring spoons shown below (for preparation of solution containing bicarbonate) may be ordered from T.A.L.C. (Foundation for Teaching Aids at Low Cost), 30 Guilford Street, London WC1N 1EH, England.



Note: All measurements given here are for dry ingredients of average coarseness.

If you measure the salts and sugars in bulk, it is very important to mix them well before dividing them into smaller amounts.

Rehydration solutions that contain sugar and 3 salts (as described above) are best. ORS packets are most convenient for making rehydration solutions because the sugar and salts are already measured. Other solutions, for example those made with common salt and sugar (as described in Annex 1), should be used *only* if ORS packets or the recommended sugar and salts are not available.

ANNEX 3. ORAL REHYDRATION USING A NASOGASTRIC TUBE

If health workers have been trained to use a nasogastric tube, they can administer ORS solution to a child who is not in shock but cannot drink. When a child is in shock, this procedure should be used only as an emergency measure (that is, when it is not possible to use the intravenous method).

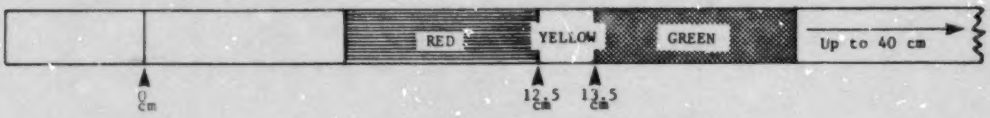
- ORS solution can be put into the nasogastric tube using a syringe or a clean, used, intravenous infusion bottle.
- The recommended rate is 20 ml/kg of body weight per hour.

Note: If the patient's abdomen becomes swollen during this treatment, stop giving ORS solution immediately.

ANNEX 4. USE OF THE TRICOLOURED ARM-STRIP

When babies are about 1 year old, they have quite a lot of fat under the skin of their arms. Children of 5 years old have much less fat and more muscle. The distance around the upper arm remains almost the same between the ages of 1 and 5 years. If a child is undernourished, this distance is reduced, his muscles waste, and his arm becomes thin. By placing a special measuring strip around the upper arm one can find out whether a child between the ages of 1 and 5 years is undernourished or not.

This measuring strip is called a tricoloured arm-strip and is shown below.



You can make a similar arm-strip from a string or strip of material that does not stretch; be careful that the markings are accurate.

To use this strip:

Put the strip around the mid upper arm of the child and see which colour is touched by the 0-cm mark on the strip.

- If the *green* part is touched, the child is well nourished.
- If the *yellow* part is touched, the child is moderately undernourished.
- If the *red* part is touched, the child is severely undernourished.

This method of measuring the arm is useful because the health worker can determine undernutrition in a child without using a weighing machine or knowing the child's age. However, since it only shows large changes in a child's nutrition, it is not suitable for determining whether the child is improving during rehydration treatment.

ANNEX 5. CHECKLIST OF POINTS OF ESSENTIAL KNOWLEDGE

In order to prevent and treat acute diarrhoea a health worker should be able to:

— define diarrhoea in a way that is appropriate to the setting in which he/she works
— distinguish between acute and chronic diarrhoea
— explain why diarrhoea is dangerous
— explain how diarrhoea causes dehydration
— describe the basic principles of the treatment of diarrhoea
— explain and demonstrate to family members how to treat diarrhoea in the home to prevent dehydration
— explain the three rules for home treatment
— ask, look, and feel for the signs of dehydration or other serious problems
— determine the appropriate treatment plan using the assessment chart given in Annex 7
— demonstrate how to prepare ORS solution correctly
— demonstrate how to prepare alternative solutions and explain when this is appropriate
— utilize treatment plans A, B, and C correctly
— keep appropriate records of treatment given
— explain to family members the principles of preventing diarrhoea.

ANNEX 6. CARD TO BE GIVEN TO FAMILY MEMBERS

HOW TO TREAT DIARRHOEA AT HOME

HOW TO TREAT DIARRHOEA AT HOME

1.

AS SOON AS DIARRHOEA STARTS, GIVE YOUR CHILD MORE FLUIDS THAN USUAL, for example,:

- rice water, fruit juice, coconut water, weak tea, soups or salt and sugar solution and
- breast milk, or milk feeds which you mix with equal amounts of water.

2.

GIVE THE CHILD FOOD:

- as much as he wants
- 5–7 times a day
- which is easy to digest, for example, boiled rice, porridges, soups, eggs, fish and well-cooked meat
- which contains potassium, for example, bananas, carrots, lentils, and pineapple

3.

LOOK AND FEEL FOR THE SIGNS OF DEHYDRATION. HERE ARE SOME OF THEM:

- greater thirst
- dark urine
- unwell, sleepy or irritable condition
- sunken eyes
- sunken soft spot on the top of the head
- a pinch of skin goes back slowly

TAKE YOUR CHILD BACK TO THE HEALTH CENTRE OR COMMUNITY HEALTH WORKER, IF:

- you see any of these signs
- your child has diarrhoea for another 2 days

4.

YOU CAN PREVENT DIARRHOEA, IF:

- you give your child fresh, clean and well-cooked food and clean drinking-water
- you practise good hygiene.

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ANNEX 7. DIARRHOEA TREATMENT CHART

		A	B	C	D
1 ASK ABOUT	DIARRHOEA	Less than 4 liquid stools per day	4 to 10 liquid stools per day	More than 10 liquid stools per day	Longer than 3 weeks duration (chronic diarrhoea)
	VOMITING	None or a small amount	Some	Very frequent	Blood or mucus in the stool
	THIRST	Normal	Greater than normal	Unable to drink	
	URINE	Normal	A small amount, dark	No urine for 6 hours	
2 LOOK AT	CONDITION	Well, alert	Unwell, sleepy or irritable	Very sleepy, unconscious, floppy or having fits	Severe undernutrition
	TEARS	Present	Absent	Absent	
	EYES	Normal	Sunken	Very dry and sunken	
	MOUTH and TONGUE	Wet	Dry	Very dry	
	BREATHING	Normal	Faster than normal	Very fast and deep	
3 FEEL	SKIN	A pinch goes back quickly	A pinch goes back slowly	A pinch goes back very slowly	
	PULSE	Normal	Faster than normal	Very fast, weak, or you cannot feel it	
	FONTANELLE (in infants)	Normal	Sunken	Very sunken	
4 TAKE TEMPERATURE					High fever - 38.5°C (or 101°F) or greater
5 WEIGH IF POSSIBLE		No weight loss during diarrhoea	Loss of 25-100 grams for each kilogram of weight	Loss of more than 100 grams for each kilogram of weight	
6 DECIDE		The patient has **no signs of dehydration**	If the patient has 2 or more of these signs, he has **some dehydration**	If the patient has 2 or more of these danger signs, he has **severe dehydration**	If the patient has chronic diarrhoea, severe undernutrition, or high fever, treat or refer to _____ for treatment If there is blood or mucus in the stool and high fever, suspect dysentery and treat with antimicrobials
		Use Plan A	Use Plan B	Use Plan C	

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TREATMENT PLAN A
TO PREVENT DEHYDRATION

Explain to the mother how to treat diarrhoea at home following three rules:

1. GIVE YOUR CHILD MORE FLUIDS THAN USUAL, such as:
   - rice water, fruit juice, weak tea, soup, or salt and sugar solution; and
   - breast milk, or milk feeds mixed with equal amounts of water.

2. GIVE YOUR CHILD FOOD:
   - as much as he wants;
   - 5 to 7 times a day;
   - which is easy to digest;
   - which contains potassium.

3. WATCH FOR SIGNS OF DEHYDRATION. (You must show the mother how to ASK, LOOK, and FEEL for the signs. Then ask her to show you what she has learned.)
   BRING YOUR CHILD BACK, IF:
   - you see any signs;
   - your child has diarrhoea for another two days.

Tell the mother these rules are important.
Explain that she can prevent diarrhoea, if:

- she gives her child fresh, clean and well-cooked food and clean drinking-water;
- she practises good hygiene.

Show the mother how to prepare and give ORS solution at home, if:

- her child has been on plan B;
- it is national policy to give ORS solution to all children who visit a health centre for diarrhoea treatment;
- the mother cannot come back if the diarrhoea gets worse.

GIVE THE MOTHER ENOUGH ORS PACKETS FOR 2 DAYS.

TELL HER THAT, AFTER EACH LOOSE STOOL, SHE SHOULD GIVE:

- 50–100 ml (¼–½ cup) of ORS solution for a child less than 2 years old;
- 100–200 ml for older children.

Adults can take as much as they want.

If the child vomits, she should wait 10 minutes and then continue slowly giving small amounts.

NOTE: Children being given ORS solution should **not** also receive salt and sugar solution.

TREATMENT PLAN B
TO TREAT DEHYDRATION WITH ORS SOLUTION

1. USE THIS TABLE TO SEE HOW MUCH ORS SOLUTION IS SUITABLE FOR 4–6 HOURS' TREATMENT:

Patient's weight in kilograms		3 5 7 9 11 13 15 20 30 40 50					
Patient's age *		2 4 6 8 10 12 18 2 3 4 6 8 15 adult ← months → ← years →					
Give this much solution for 4-6 hours	in ml:	200-400	400-600	600-800	800-1000	1000-2000	2000-4000
	in local unit of measure:						

* Use the patient's age only when you do not know the weight.

If the patient wants more ORS solution, give more. If the eyelids become puffy, stop and give other fluids. If diarrhoea continues, use ORS solution again when the puffiness has gone.

If the child vomits, wait 10 minutes and then continue slowly giving small amounts of ORS solution.

2. If the mother can remain at the health centre:
- tell her how much ORS solution to give her child;
- show her how to give it;
- watch her give it.

3. After 4–6 hours reassess the child. Then choose the suitable treatment plan.

NOTE: FOR CHILDREN UNDER 12 MONTHS CONTINUING TREATMENT PLAN B AFTER 4–6 HOURS, TELL THE MOTHER TO GIVE:
- breast-milk feeds between drinks of the ORS solution, or
- 100–200 ml of clean water before continuing ORS, if she does not breast-feed her child.

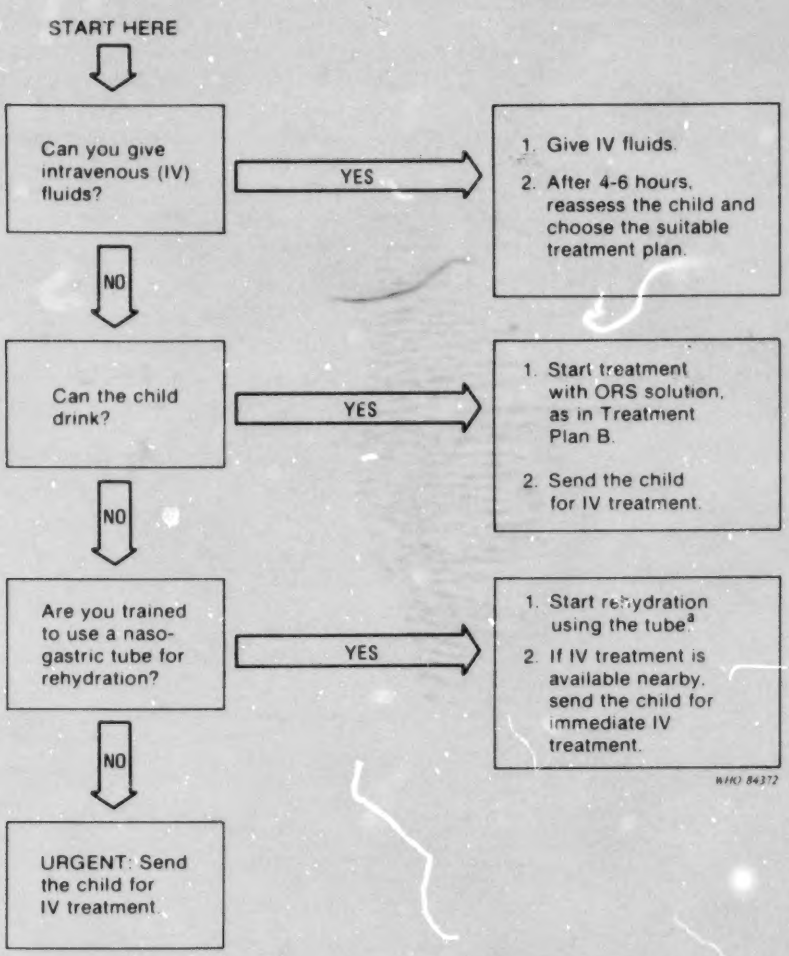
4. If the mother must leave before completing treatment plan B, tell her:
- to finish the 4–6 hour treatment as in 1 above;
- to give the child as much ORS solution as he wants after the treatment;
- to look for signs of dehydration and, if the child has any, to return the next morning.

Give her enough ORS packets for 2 days and show her how to prepare ORS solution.

Explain briefly how to prevent diarrhoea.

TREATMENT PLAN C
TO TREAT SEVERE DEHYDRATION QUICKLY

Follow the arrows. If the answer to the questions is 'yes', go across. If it is 'no', go down.


START HERE
Can you give intravenous (IV) fluids?
YES
1. Give IV fluids.
2. After 4-6 hours, reassess the child and choose the suitable treatment plan.
NO
Can the child drink?
YES
1. Start treatment with ORS solution, as in Treatment Plan B.
2. Send the child for IV treatment.
NO
Are you trained to use a naso-gastric tube for rehydration?
YES
1. Start rehydration using the tube[a]
2. If IV treatment is available nearby, send the child for immediate IV treatment.
NO
URGENT: Send the child for IV treatment
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NOTE: If the child has a high fever, show the mother how to cool the child with a wet cloth and fanning.

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[a]See Annex 3.

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